

In the Claims:

1. (Currently Amended) An inkjet ink set ~~consisting essentially of~~ comprising:
a pigment-based black ink including at least one self-dispersed black pigment,
at least one cosolvent, water, optionally at least one water-soluble
surfactant/amphiphile, and a at least one bleed-controlling polymer consisting
~~essentially of a~~ of hydrolyzed ~~form of~~ styrene-maleic anhydride copolymer; and
at least one dye-based color ink including a component selected from the
group consisting of multivalent salts and organic acids, a water-soluble dye, at least
one cosolvent, and water;

wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ interacts with said multivalent salts which are incompatible therewith, or wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ interacts with said organic acids by rendering said polymer in said pigment-based black ink insoluble by transforming said polymer into a water-insoluble protonated form and thereby improve black-to-color bleed; ;

and wherein said organic acids are selected from the group consisting of: polyacrylic, acetic, glycolic, malonic, malic, maleic, ascorbic, succinic, glutaric, fumaric, citric, tartaric, lactic, sulfonic, ortho-phosphoric acids and mixtures thereof;

and wherein no bleed-controlling polymer besides the hydrolyzed styrene-maleic anhydride copolymer is present in the pigment-based black ink;

and wherein no dispersible black pigment is present in the pigment-based black ink;

and wherein all of the inks in the inkjet ink set include either at least one bleed-controlling polymer or at least one component capable of interacting with the at least one bleed-controlling polymer.

2. (Previously Presented) The inkjet ink set of Claim 1 wherein said self-dispersed black pigment has a concentration in said pigment-based black ink ranging from about 0.001 to 10 wt%.

3. (Canceled)

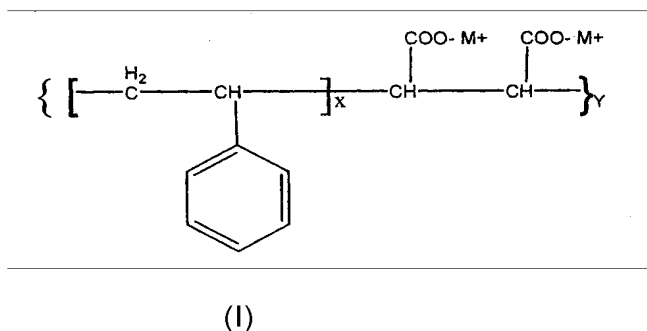
4. (Previously Presented) The inkjet ink set of Claim 1 wherein said cosolvent has a concentration in said pigment-based black ink ranging from about 0.01 to 50 wt%.

5. (Previously Presented) The inkjet ink set of Claim 1 wherein said at least one surfactant/amphiphile has a concentration in said pigment-based black ink of up to 40 wt%.

6. (Previously Presented) The inkjet ink set of Claim 5 wherein said at least one surfactant/amphiphile has a concentration ranging from about 0.1 to 5 wt%.

7. (Previously Presented) The inkjet ink set of Claim 1 wherein said water comprises the balance of said pigment-based black ink.

8. (Currently Amended) The inkjet ink set of Claim 1 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has the general formula:



where counter-ion M⁺ is selected from the group consisting of sodium, potassium, ammonium, trimethylammonium, and lithium, and where X \cong 1 and Y \cong 22.

9. (Currently Amended) The inkjet ink set of Claim 8 wherein said at least one bleed-controlling polymer ~~copolymer~~ has a molar ratio of styrene to maleic anhydride repeat units within a range of 0.2 to 5.

10. (Previously Presented) The inkjet ink set of Claim 9 wherein said molar ratio is within a range of 0.5 to 2.

11. (Currently Amended) The inkjet ink set of Claim 8 wherein said at least one bleed-controlling polymer ~~copolymer~~ has a molecular weight within a range of about 500 to 50,000 (molecular weight average).

12. (Original) The inkjet ink set of Claim 11 wherein said molecular weight is within a range of about 1,000 to 10,000.

13. (Currently Amended) The inkjet ink set of Claim 1 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has a concentration in said pigment-based black ink ranging from about 0.1 to 10 wt%.

14. (Currently Amended) The inkjet ink set of Claim 13 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has a concentration ranging from about 0.1 to 3 wt%.

15. (Previously Presented) The inkjet ink set of Claim 1 wherein said multivalent salts include at least one multivalent cation.

16. (Original) The inkjet ink set of Claim 15 wherein said at least one multivalent cation is selected from the group consisting of alkaline metal earths of Group 2A of the Periodic Table, transition metals of Group 3B of the Periodic Table, cations from Group 3A of the Periodic Table, lanthanides, and mixtures thereof.

17. (Original) The inkjet ink set of Claim 16 wherein said at least one multivalent cation is selected from the group consisting of magnesium, calcium, lanthanum, aluminum, neodymium, and mixtures thereof.

18. (Previously Presented) The inkjet ink set of Claim 15 wherein said at least one multivalent cation is present in an amount ranging from about 1 to 10 wt% of said at least one dye-based color ink.

19. (Previously Presented) The inkjet ink set of Claim 1 wherein said at least one dye-based color ink includes at least one of said organic acids.

20. (Canceled)

21. (Canceled)

22. (Previously Presented) The inkjet ink set of Claim 1 wherein said at least one organic acid is present in an amount ranging from about 0.25 to 20 wt% of said at least one dye-based color ink.

23. (Previously Presented) The inkjet ink set of Claim 22 wherein said at least one organic acid is present in an amount ranging from about 1 to 5 wt% of said at least one dye-based color ink.

24. (Currently Amended) A method of controlling bleed between a black pigment-based inkjet ink and a color dye-based inkjet ink, said method comprising:

formulating said pigment-based black ink ~~consisting essentially of~~ comprising at least one bleed-controlling polymer consisting of a hydrolyzed form of styrene-maleic anhydride copolymer, at least one self-dispersed black pigment, at least one cosolvent, water, and optionally at least one water-soluble surfactant/amphiphile;

formulating said at least one dye-based color ink ~~consisting essentially of~~ comprising a component selected from the group consisting of multivalent salts and organic acids, a water-soluble dye, at least one cosolvent, water, and combinations thereof, wherein said organic acids are selected from the group consisting of: polyacrylic, acetic, glycolic, malonic, malic, maleic, ascorbic, succinic, glutaric, fumaric, citric, tartaric, lactic, sulfonic, ortho-phosphoric acids and mixtures thereof; and

printing said pigment-based black ink adjacent said at least one dye-based color ink whereby said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ interacts with said multivalent salts which are incompatible therewith, or wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ interacts with said organic acids by rendering said ~~copolymer~~ at least one bleed-controlling polymer in said pigment-based black ink insoluble by transforming said ~~copolymer~~ at least one bleed-controlling polymer into a water-insoluble protonated form;

and wherein no bleed-controlling polymer besides the hydrolyzed styrene-maleic anhydride copolymer is present in the pigment-based black ink;

and wherein no dispersible black pigment is present in the pigment-based black ink.

25. (Previously Presented) The method of Claim 24 wherein said self-dispersed black pigment has a concentration in said pigment-based black ink ranging from about 0.001 to 10 wt%.

26. (Canceled)

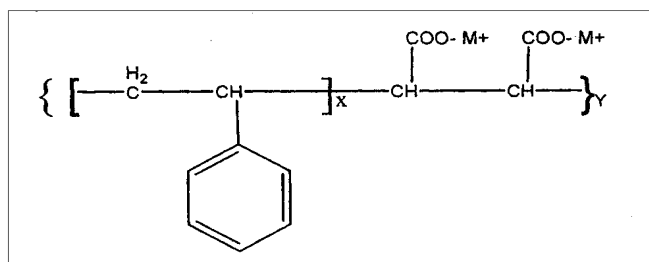
27. (Previously Presented) The method of Claim 24 wherein said cosolvent has a concentration in said pigment-based black ink ranging from about 0.01 to 50 wt%.

28. (Previously Presented) The method of Claim 24 wherein said at least one surfactant/amphiphile has a concentration in said pigment-based black ink up to 40 wt%.

29. (Previously Presented) The method of Claim 28 wherein said at least one surfactant/amphiphile has a concentration ranging from about 0.1 to 5 wt%.

30. (Previously Presented) The method of Claim 24 wherein said water comprises the balance of said pigment-based black ink.

31. (Currently Amended) The method of Claim 24 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has the general formula:



(I)

where counter-ion M⁺ is selected from the group consisting of sodium, potassium, ammonium, trimethylammonium, and lithium, and where X \cong 1 and Y \cong 22.

32. (Currently Amended) The method of Claim 31 wherein said at least one bleed-controlling polymer ~~copolymer~~ has a molar ratio of styrene to maleic anhydride repeat units within a range of 0.2 to 5.

33. (Previously Presented) The method of Claim 32 wherein said molar ratio is within a range of 0.5 to 2.

34. (Currently Amended) The method of Claim 31 wherein said at least one bleed-controlling polymer ~~copolymer~~ has a molecular weight within a range of about 500 to 50,000 (molecular weight average).

35. (Currently Amended) The method of Claim 34 wherein said molecular weight is within a range of about 1,000 to 10,000.

36. (Currently Amended) The method of Claim 34 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has a concentration in said pigment-based black ink of about 0.1 to 10 wt%.

37. (Currently Amended) The method of Claim 36 wherein said at least one bleed-controlling polymer ~~hydrolyzed styrene-maleic anhydride copolymer~~ has a concentration of about 0.1 to 3 wt%.

38. (Previously Presented) The method of Claim 24 wherein said multivalent salts include at least one multivalent cation.

39. (Previously Presented) The method of Claim 38 wherein said at least one multivalent cation is selected from the group consisting of alkaline metal earths of Group 2A of the Periodic Table, transition metals of Group 3B of the Periodic Table, cations from Group 3A of the Periodic Table, lanthanides, and mixtures thereof.

40. (Previously Presented) The method of Claim 39 wherein said at least one multivalent cation is selected from the group consisting of magnesium, calcium, lanthanum, aluminum, neodymium, and mixtures thereof.

41. (Previously Presented) The method of Claim 38 wherein said at least one multivalent cation is present in an amount ranging from about 1 to 10 wt% of said color ink.

42. (Previously Presented) The method of Claim 24 wherein said at least one dye-based color ink includes at least one of said organic acids.

43. (Canceled)

44. (Canceled)

45. (Previously Presented) The method of Claim 42 wherein said at least one of said organic acids is present in an amount ranging from about 0.25 to 20 wt% of said at least one dye-based color ink.

46. (Previously Presented) The method of Claim 45 wherein said at least one of said organic acids is present in an amount ranging from about 1 to 5 wt% of said at least one dye-based color ink.

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47. (Canceled)